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THE PERCEPTION OF FRENCH SENTENCES WITH  
A SURFACE STRUCTURE AMBIGUITY <sup>1)</sup>

BY

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INTRODUCTION

In transformational grammar syntactic descriptions are at two distinct levels. First, there is a deep structure assigned to a sentence. This deep structure contains all the grammatical information necessary for a full semantic interpretation of the sentence, such as subject-predicate relations, main verb-object relations etc. Second, there is the surface structure of the sentence, which is an abstract representation of all the phonologically relevant aspects of the sentence. The connection between the two structures is by a series of transformations, mapping deep structure phrase markers onto surface structure phrase markers. (For an introduction see LEVELT, 1966.)

In this note we will be concerned with some psychological aspects of surface structure.

A grammar is a theory of the language user's *knowledge* of his language. Some people prefer the term „intuition” to „knowledge”, because the native speaker's language knowledge is hardly ever explicit. A grammar is not a theory of language *use*, i.e. a theory about the ways people use their implicit knowledge while speaking or listening. The experiment to be reported now, has been designed to investigate certain aspects of the ways native speakers use their intuition about certain aspects of surface structure, while speaking and listening.

In order to discuss the details of this study we have to introduce the notion of *surface structure ambiguity*. A sentence is surface structure ambiguous if two different surface phrase markers can dominate the

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<sup>1)</sup> This note is a short summary of an article to be published elsewhere (Levelt, Zwanenburg & Ouweneel, 1969).



same series of words (or: formatives). This means, in general, that the sentence has two possible constituent structures, each constituent structure being related to a particular interpretation of the sentence. An example is „*they are hiding children*”. In this sentence *hiding* can be an adjective in the constituent *hiding children* or it can be a verb in the constituent *are hiding*. There are in fact two different sentences; the native speaker has no difficulty in understanding the existence of this ambiguity.

According to transformational theory different phonetic forms are assigned to different surface structures. Or, in other terms, the language user knows that two different sound patterns correspond to the two possible constituent structures. This is a strong claim in itself, which needs empirical verification (see for this: CHOMSKY and HALLE, 1968). A second question however, which will concern us here, is whether and how such knowledge is used in actual performance.

#### THE EXPERIMENT

The material of the experiment consisted of 48 surface structure ambiguous French sentences. In a pre-experiment they had been selected from a much larger set.<sup>2)</sup> This was in order to eliminate those sentences that were in general understood in only one dominant sense. All sentences had the same ambiguity, therefore one example may suffice to explain the syntactic material:

*On a tourné ce film intéressant pour les étudiants*

There are two possible constituent structures: *pour les étudiants* may belong to *intéressant*; the film, then, is interesting for the students. But *pour les étudiants* may as well modify the verb *tourné*, in the sense that the movie is shown to the students. In the latter case *pour les étudiants* does not form one constituent with *intéressant*.

In these 48 test sentences, therefore, the prepositional phrase can either modify the verb or the adjective.

Four adult native speakers of French, all women, read little stories. In each of these stories one of the test sentences was embedded in a completely unambiguous context. For each test sentence two different contexts had been designed, one for each possible meaning. After the

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<sup>2)</sup> All sentences have been constructed by Dr. W. Zwanenburg (Romaans Instituut, Groningen University). He will report elsewhere on the implications of the present experiment for French phonology.



speakers had read the stories it was explained that they had been reading ambiguous sentences. They were then told that their next task would be to pronounce such sentences in isolation, in such a way that it would be easy for the listener to understand which of the two possible meanings was intended.

In this way we had four recorded versions of each test sentence; two versions of the sentence spoken in context, i.e. unintentionally, and two versions of the sentence spoken in isolation, i.e. with the intention to disambiguate.

The context embedded sentences were cut from the tapes, and in a balanced design 28 native speakers of French<sup>3)</sup> listened to the test sentences. Care was taken that each subject listened to only one version of a particular test sentence, but each listener got all 48 test sentences, twelve from each speaker.

The task of the subjects was to determine which of the two meanings of the sentence had been intended by the speaker. They were very carefully instructed and gave their responses by underlining either the adjective or the verb of a typewritten version of the sentence, according to whether the prepositional phrase belonged to the adjective or the verb.

## RESULTS AND DISCUSSION

We will mention the main results of the experiment only.

1. The sentences spoken in context were correctly interpreted in 60 % of the cases. This is significantly ( $p < .025$ ) above the 50 % chance level. But it is not an impressive difference. The interpretations were about equally well for sentences spoken by different speakers. There was no significant difference between the four speakers.

These results are in good agreement with the data from ANNE DOW's Harvard thesis (1966). For many similar cases she found only chance results. She suggested that in fact native speakers might not have the knowledge how to express the structural information in a phonetic form, i.e. she doubted the claim of the transformational grammarians. Another explanation, however, may be that the speakers do not use the competence they actually have. This latter explanation is preferable in view of the results for sentences spoken in isolation.

2. The sentences spoken in isolation were correctly interpreted by the subjects in 75 % of the cases. This is a substantial difference from the former 60 % level ( $p < .02$ ). Therefore it is in the capacity of native

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<sup>3)</sup> From the Lycée Français de La Haye.



speakers of French to phonetically disambiguate these ambiguous sentences. This is precisely the claim of the transformational theory.

The conclusion, therefore, can be that, if a speaker is not forced to do so, he will not express the full surface structure information in the phonetic form of the sentence. This is especially so for sentences spoken in context. The rule of performance seems to be that if the context is sufficiently disambiguating, a less than maximal effort is taken to express the ambiguity in the prosody of the sentence. Language competence is not necessarily implemented in all actual language performance.

GOLDMAN-EISLER (1968) has shown that the process of reading is rather different from spontaneous speech. It seems plausible that the disambiguating effort will be even less in the case of spontaneous speech. The 60 % of our context condition may very well drop to a random 50 % for spontaneous speech.

Further data on the acoustic cues that may have been carrying the disambiguating information in these sentences can be found in LEVELT, ZWANENBURG and OUWENEEL (1969).

#### SUMMARY

French sentences like „On a tourné ce film intéressant pour les étudiants”, are ambiguous in surface structure. 48 of them were read unintentionally in disambiguating contexts and also in isolated form with the explicit intention to disambiguate them. The four versions, so obtained were presented in isolated form to 28 subjects. They had to judge which of the two meanings had been intended by the (4) speakers. 60 % of the context sentences and 75 % of the „intentional” sentences were correctly identified both significantly above chance).

Conclusions are drawn about the relation between language competence and performance.

#### REFERENCES

- CHOMSKY, N. and M. HALLE, *The sound pattern of English*. New York, Harper & Row, 1968.
- DOW, A., *The relation of prosodic features to syntax*. Masters thesis, Dept. of linguistics, Harvard University, 1966.
- GOLDMAN-EISTER, F., *Experiments in spontaneous speech*. London, Academic Press, 1968.
- LEVELT, W. J. M., *Generatieve Grammatica en Psycholinguïstiek I en II*, Ned. T. Psychol. **21**, 317—337, 367—400, 1966.
- , W. ZWANENBURG and G. R. E. OUWENEEL, *Ambiguous surface structure and phonetic form in French*. Heymans Bulletin HB-69-28 EX, Dept. of Psychology, Groningen University, 1969.